

THE
ONTARIO WATER RESOURCES
COMMISSION
WATER POLLUTION SURVEY
of the
TOWN OF THORNBURY

September, 1965

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ONTARIO WATER RESOURCES COMMISSION

Report on

A

Water Pollution Survey

of the

Town of Thornbury

September, 1965

Division of Sanitary Engineering

REPORT
on a
WATER POLLUTION SURVEY
of the
TOWN OF THORNBURY

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REPORT

ONTARIO WATER RESOURCES COMMISSION

I INTRODUCTION

A water pollution survey of the Town of Thornbury was made on May 12, 1965. Previously, the OWRC had made a water pollution survey of the municipality on January 20, 1959. Therefore, in addition to locating and recording any new sources of pollution in the town, the purpose of this investigation was to up-date the information obtained in the earlier survey.

Surveys of this nature are conducted routinely and upon request throughout the Province of Ontario by the Ontario Water Resources Commission as a basis for evaluating any existing or potential sources of pollution.

Recommendations are made pertaining to water pollution abatement, and the Commission expects that corrective measures will be taken by those concerned.

The Commission recommended in 1959 that: "Adequate treatment facilities should be provided for all waste discharges to the river or bay." No action has been taken to implement this recommendation.

Mr. W.N. Chalk, Clerk-Treasurer, was interviewed on May 12, 1965. His assistance and co-operation are greatly appreciated.

II GENERAL

The Town of Thornbury, in the County of Grey, is located on the shore of Georgian Bay approximately 25 miles east of the

City of Owen Sound. The 1964 assessed population was 1,171, and based on a total acreage of 712, a population density of 0.6 persons per acre is indicated.

The principle industries are located in the eastern section of the municipality. The existing combined sewers are all located in the western section of the town. This drainage system has been installed in various stages since 1926. The part of the municipality not serviced by the combined sewers relies on open ditches for surface drainage. Thornbury lies within the Beaver River and Georgian Bay watersheds. However, a small watercourse known locally as Little River drains the western section of the town.

Sandy loam and heavy textured limestone or clayey till form the existing soil structure. These soil conditions make the installation of septic tank and sub-surface tile field disposal beds impractical in some areas of the town.

The principal industry, Georgian Bay Fruit Growers Limited, provides full time and some seasonal employment. The other industries located in Thornbury are JMG Manufacturing Company Limited, Beaver Valley Co-Op Limited, Orchard Dairy, Ardiel Brothers, Canadian E.M.A. Company Limited, F. W. Gilchrist Company Limited, Imperial Hay Company Limited and Noble Boat Works.

III WATER USES

(a) Municipal

The Town of Thornbury takes water from the Beaver River. Treatment facilities at the plant include coagulation and sedimentation by means of an Accelator unit, filtration and chlorination. The Commission has recommended that consideration be given to provision of additional filter capacity and/or storage capacity on the system. At present, storage is provided by a 50,000 gallon elevated storage tank.

The quality of the treated water from this water works has usually been satisfactory. At the time of the last OWRC inspection on January 13, 1965, a satisfactory chlorine residual of 0.5 ppm was obtained.

During the year 1964, an average daily pumpage of 280,557 gallons was indicated by the metered pumpages for the year.

(b) Industrial

The Georgian Bay Fruit Growers Limited is probably the greatest consumer of municipal water, with a daily usage of approximately 50,000 gpd during the canning season. This industry uses an additional 100,000 gpd from a private supply for cooling purposes only.

(c) Recreational

There is some recreational use made of the Beaver River and that part of Georgian Bay which forms the northern limit of

the town. The principle recreational uses are fishing, boating and a minimal amount of swimming.

IV WATER POLLUTION

(a) Sanitary Waste Disposal

The combined sewers discharge to the Beaver River immediately upstream from the CN bridge. The remainder of the municipality relies on private sewage disposal systems.

The Grey County Health Unit reported some instances of malfunctioning septic tank and sub-surface disposal beds. However, for the most part, satisfactory disposal of sanitary sewage is achieved employing this method.

(b) Industrial Waste Disposal

There are several instances of unsatisfactory industrial waste disposal and these are discussed in the following paragraphs.

Georgian Bay Fruit Growers Limited

This plant is situated in the eastern section of Thornbury on Highway No. 26.

There are approximately 200 employees employed at this industry during the canning season, which normally begins in September and ends in November. Two eight-hour shifts are worked per day during the processing season. During the off-season, a skeleton staff of about six is retained in the processing plant, in addition to the office staff of about six

persons. Sanitary wastes from the cold storage and office buildings is disposed of by means of septic tank and sub-surface tile field systems. Sanitary wastes from the processing plant discharge to a septic tank and then to the drain.

Applesauce, apple juice and orange drink are produced at this plant.

As previously discussed, there are two sources of water for the industry. The total water supply obtained from the Public Utilities Commission and the untreated Beaver River supply, which is used for cooling purposes, would result in an average daily water consumption of approximately 150,000 gallons during peak production.

The contaminated waste water, estimated to be 50,000 gpd, originating from the production of apple juice and apple sauce, is passed through a Kason Screen Separator. The effluent from the screen is discharged to Georgian Bay. The solids removed by the screens are collected in a truck and hauled away for land disposal.

Extensive sampling of the effluent from the screens was conducted at the time of installation, and the results are reported in a Commission report dated October 6, 1963. The results indicated that the BOD of these wastes following screening varied from 2,000 ppm to 5,800 ppm. The suspended solids values were approximately 100 ppm, which indicates good reduc-

tions in suspended solids. Based on the minimum BOD of 2,000 ppm obtained in a sample collected on October 6, 1963, and an estimated waste flow of 50,000 gpd, the plant is releasing approximately 1,000 pounds of BOD per day to the lake. The BOD of the waste varies with the type of apples being used and the length of storage of the apples before use. A BOD and suspended solids loading on a lake of this magnitude is unacceptable. A consulting engineer should be retained to prepare a report on waste treatment facilities.

JMG Manufacturing Company Limited

This company produces steel products, principally steel fabricating and hydraulic cylinders. The industry does not create an excessive demand on the municipal water system. Water used for cooling purposes is discharged to Georgian Bay via a 14 inch diameter concrete drain.

Sanitary wastes from the plant are disposed of by means of a septic tank and sub-surface tile field system. The unit appears to be operating satisfactorily.

Orchard Dairy

This dairy produces bottled milk. Water for this milk plant is obtained from the municipal supply.

The sanitary and industrial wastes from the dairy are discharged to the main Bruce Street combined sewer.

(c) Refuse Disposal

The town operates a burn and cover type of disposal area

for municipal refuse. The dump is located on Lots 40 - 46 at the corner of King Street and Lansdown Street. There appears to be no water pollution problem generated by this dump.

(d) Discussion of Laboratory Results

Samples were collected from the watercourses and pertinent outfalls ^{WERE} and submitted to the Ontario Water Resources Commission Laboratory for chemical analyses and bacteriological examination. The laboratory results of these samples and samples collected in this area within the past three years are appended to this report. A glossary of terms is also attached giving descriptions of the significance of the tests applied in this survey. The Commission's water quality objectives are included in the appendix.

It is noted that, in general, the chemical quality of the surface waters in Thornbury is satisfactory. However, the discharge of raw sanitary sewage to a watercourse is an unsuitable environmental condition. Water for recreational use (boating and bathing) should not only be aesthetically attractive but also should be of acceptable bacterial quality. It is noted that in some instances the bacteriological quality of the water is in excess of the Commission's maximum objective of not greater than 2,400 coliform organisms per 100 ml.

The analysis of samples collected from the Georgian Bay Fruit Growers Limited outfall indicates that during the canning

season the industrial wastes are unsuitable for discharge to a watercourse without further treatment.

V SUMMARY AND CONCLUSIONS

A water pollution survey of the Town of Thornbury was made on May 12, 1965. The water pollution problems existing in the municipality were reviewed.

Raw sanitary wastes from the area of the town serviced by the combined sewer system discharge to the Beaver River. This practice is undesirable and should be discontinued.

The Georgian Bay Fruit Growers Limited industrial wastes are passed through a Kason Screen Separator and then discharged to Georgian Bay. The 5-Day BOD and suspended solids concentrations in the waste make it unsatisfactory for discharge to a watercourse. This company should retain a consulting engineer to prepare a preliminary report on a form of industrial waste treatment. These plans should be submitted to the OWRC for approval.

It is suggested that Thornbury should take an active interest in a water pollution abatement programme. The municipality should exercise more effective control of future development and ensure that water impairment problems are not caused as a result of this development.

A preliminary engineering report was prepared by Philips and Roberts Limited, Consulting Engineers, dated February 28,

1964. A 100,000 U.S. gpd total oxidation plant was recommended. The cost of the treatment plant and the first of the sanitary sewers was estimated at \$168,000. Existing combined sewers could also be utilized.

It was reported that the municipality had terminated the services of the firm of Phillips and Roberts Limited and engaged the services of Mr. W. Ainley, Consulting Engineer. Apparently consideration is being given to staging the sewage works programme. A suitable site for the proposed waste stabilization ponds has been chosen.

VII RECOMMENDATIONS

1. It is imperative that the town proceed with the provision of a sewage works.

2. The Georgian Bay Fruit Growers Limited should discontinue the practice of discharging inadequately treated wastes to Georgian Bay. A consulting engineer should be retained to prepare a preliminary report on industrial waste treatment facilities.

All of which is respectfully submitted,

District Engineer


H. Browne

Approved by

J.R. Barr, Assistant Director,
Division of Sanitary Engineering.

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Prepared by: D.A. Murray Wilson

Table I

Sampling Point No.	Description	Date	5-Day BOD (ppm)	Solids (ppm)			Turbidity in Silica Units	M.F. Coliform Count/100 ml.
				Total	Susp.	Diss.		
LR-0.1	Little River at Bay St.	May 12/65	0.8	314	9	305		72
LR-1.0	Little River at Alfred St.	May 12/65	0.5	326	4	322		86
LR-1.1	Tributary of Little River at Alfred St.	May 12/65						12
B-0.0	Beaver River at Georgian Bay	May 12/65	0.8	254	21	223		1,300
		Nov. 6/63	2.7	288	2	286		9,300
		June 25/62	0.9	256	-	-	12.0	28,000
		May 14/62	1.7	266	16	250	16	1,000
B-0.1	Beaver River at CN railway bridge	Aug. 5/65						8,600
		July 21/65	0.9	288	24	264		6,100
		June 30/65	0.8	260	21	239	9.5	40,000
		May 12/65	0.8	3800	27	3793		2,100
		Mar. 25/65	2.2	280	8	272	4.0	13,500
		Feb. 24/65	1.1	284	8	276		7,300
		Dec. 17/64	2.9	268	9	259	9.5	12,800
		Oct. 8/64	1.6	232	-	-	7.0	19,500
B-0.1 WS	Combined sanitary storm sewer outfall	This outfall is submerged and no sample was taken						

Table 1 (cont'd)

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Solids (ppm)</u>			<u>Turbidity in Silica Units</u>	<u>M.F. Coliform Count/100 ml.</u>
				<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>		
B-0.3	Beaver River at Highway No. 26	May 12/65	1.6	198	18	180		180
LHGB-411.9	Georgian Bay	May 12/65	2.2	280	17	263		27,000
I	Fruit Growers Limited	Nov. 6/63	900	3420	2010	1410		1,310,000
	industrial waste outfall	Oct. 10/63	670	1138	124	1014		2,690,000
LHGB-411.9	JMG Manufacturing	May 12/65	0.4	418	33	385		
W	Company Limited storm sewer							

Table II

<u>Description</u>	<u>Date</u>	5-Day BOD (ppm)	<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>	
Study of treatment efficiency achieved by Kason Screen Separator	October 10/63	2,000	2874	170	2704	Influent
		2,400	3026	93	2933	Effluent
		2,200	3380	525	2855	Influent
		2,300	3158	127	3031	Effluent
		3,200	4722	351	4371	Influent
		2,850	4270	101	4169	Effluent
		5,100	7788	552	7236	Influent
		5,800	7038	116	6922	Effluent

Appendix

GLOSSARY OF TERMS

Bacteriological Examinations - the Membrane Filter technique is used to obtain a direct enumeration of coliform organisms. These organisms are the normal inhabitants of the intestines of man and other warm-blooded animals. They are always present in large numbers in sewage and are, in general, relatively few in number in other stream pollutants. The results are reported as M.F. coliform count per 100 millilitres.

Biochemical Oxygen Demand (BOD) - the BOD test indicates the amount of oxygen required for stabilization of the decomposable organic matter found in the sewage, sewage effluent, polluted waters or industrial wastes by aerobic biochemical action. The time and temperature used are 5 days and 20°C respectively.

Gallon - denotes Imperial gallon unless otherwise noted.

Solids - the analyses for solids include tests for total, suspended and dissolved solids. The former measures both the solids in solution and in suspension. Suspended solids indicate the measure of undissolved solids of organic or inorganic nature; whereas the dissolved solids are a measure of those solids in solution.

Turbidity - turbidity is a measure of the fine suspended solids in water such as silt and finely divided organic matter. Where suspended solids values approach 20 parts per million or less, the results are usually reported as turbidity in silica units.

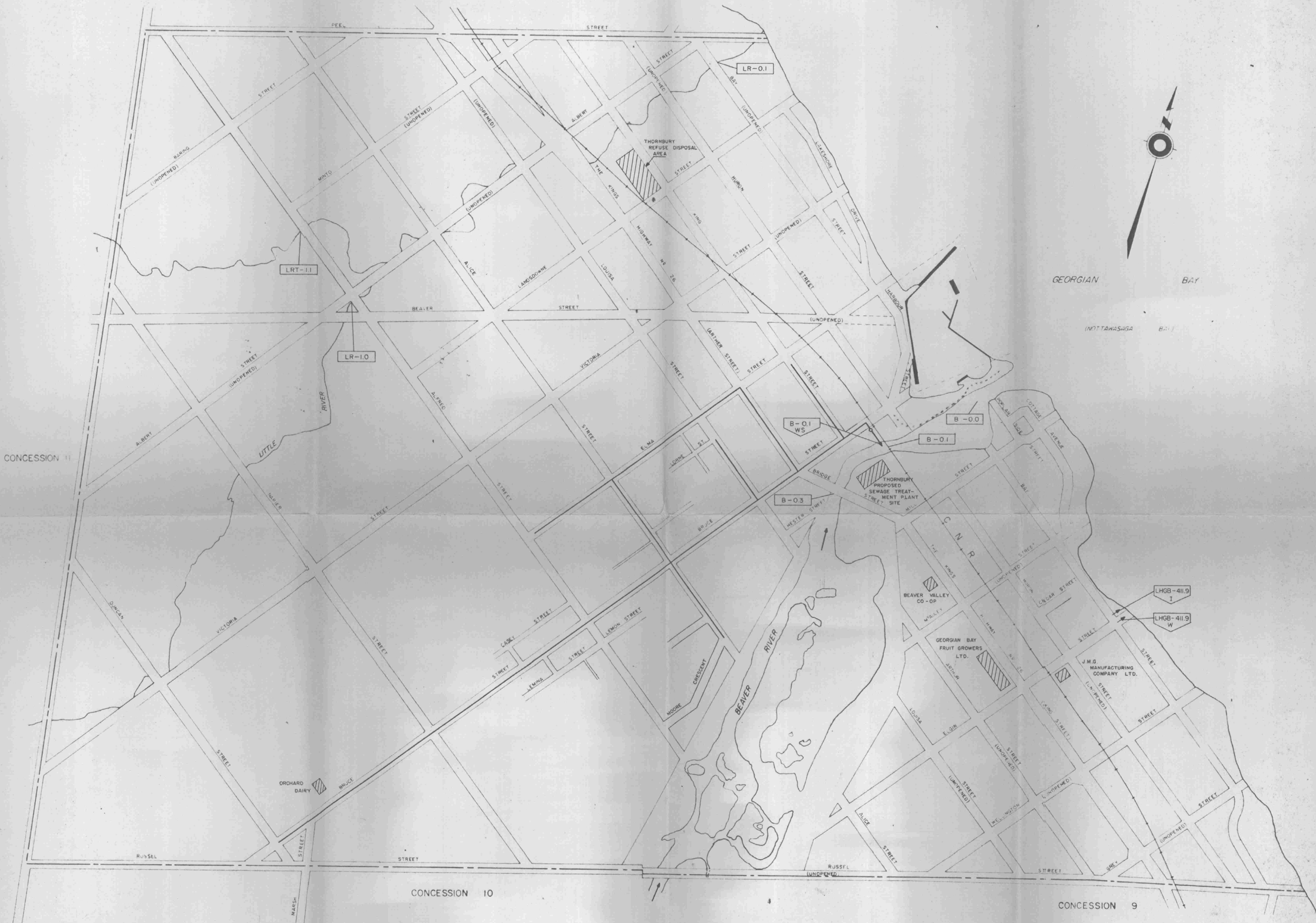
WATER QUALITY AND EFFLUENT OBJECTIVES - The desirable objectives for all surface waters in the Province of Ontario are as follows:

5-Day Bod	- Not greater than 4 ppm
M.F. Coliform Count Median Value	- Not greater than 2,400 per 100 ml
Phenolic Equivalents	
- Average	- Not greater than 2 ppb
- Maximum	- Not greater than 5 ppb
pH Range	- 6.7 to 8.5

Appendix (Cont'd)

A few pertinent maximum concentration limits of contaminants in storm sewers, sewage treatment plant and industrial waste effluents are listed below. It is noted that adequate protection for surface waters, except in certain specific instances influenced by local conditions, should be provided if the following concentrations and pH range are not exceeded.

5-Day BOD	-	Not greater than 15 ppm
Suspended Solids	-	Not greater than 15 ppm
Phenolic Equivalents	-	Not greater than 20 ppb
Ether solubles (oil)	-	Not greater than 15 ppm
pH Range	-	5.5 to 10.6



CONCESSION 11

CONCESSION 10

CONCESSION 9

VILLAGE OF CLARKSBURG TOWNSHIP OF COLLINGWOOD

LEGEND

- B-0.1 - SAMPLING POINT SHOWING STREAM AND MILEAGE
- B-0.1 WS - STREAM AND MILEAGE AT OUTFALL
- W - STORM SEWER
- I - INDUSTRIAL SEWER
- WS - STORM SEWER WITH SANITARY WASTE

ONTARIO WATER RESOURCES COMMISSION

TOWN OF THORN BURY
WATER POLLUTION SURVEY
(1965)

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